REMARKS

The Office Action dated December 17, 2004 has been carefully reviewed. Therefore, claims 1-6 are pending. Amendments to the Specification have been made to correct typographical errors. It is respectfully submitted that no new matter has been introduced as a results of the amendments herein. Reconsideration of the grounds of rejection is respectfully requested in view of the amendments and remarks herein.

Summary of the Office Action

References to paragraphs in the subject office action are referred to herein in parentheses identifying the appropriate paragraph, e.g. (para x).

The Examiner has objected to the abstract of the disclosure because the abstract contains more than one paragraph (para 1).

The Examiner has objected to the title because it contains the term "fractile" which is not know (para 2).

The Examiner has objected to the specification because it contains the term "fractile" which is not known in the art (para 4).

Claims 1-6 are rejected under 35 U.S.C. 112, second paragraph, as been indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention (para 7).

Regarding claims 1, 2, 5 and 6, the claims recite "fractile(s)". The Examiner states the claims are indefinite because the meaning for the term "fractile" cannot be determined. For the purpose of examination "fractile" has been interpreted as "fractal".

Regarding claim 2, the Examiner states the recitation, "an array having an irregular boundary contour wherein the irregular boundary contour comprises a plane tiled by a plurality of fractal, said plurality of fractal covers the plane without any gaps or overlaps" is not understood. The Examiner questions what is meant by "irregular boundary contour"?

Regarding claim 3, the Examiner states the recitation, "tiling in a plane with a plurality of non-uniform shaped unit cells of an antenna array" is not understood. The Examiner questions what is meant by "tiling a plane with plurality of non-uniform shaped unit cells of an antenna array"?

Claim 4 is rejected under 112 second paragraph as being independent over a rejected base claim.

Claim 5 is rejected under 35 U.S.C. 102(e) as being anticipated by Werner et al. (US Pub. 2003/0034918) (para 9).

The Examiner states claims 1-4 and 6 would be allowable if rewritten or amended to overcome the rejections under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action (para 10).

Summary of the Office Action

A. Amendment to the Specification

The Applicants note with appreciation the Examiner's request to correct any errors in the Specification of which the Applicants become aware. The Applicants respectfully submit an Amendment to the Specification to correct typographical errors. No new matter has been added as a result of this Amendment

B. Amendment to the Abstract

The Applicants has submitted an amendment to the Abstract to conform with the requirements of MPEP § 608.01(b).

C. Objection to the Title

The Applicants respectfully request the Examiner's withdraw of the objection to the Title because it contains the word "fractile."

The MPEP states:

> The meaning of every term used in a claim should be apparent from the prior art or from the specification and drawings at the time the application is filed. Applicants need not confine themselves to the terminology used in the prior art, but are required to make clear and precise the terms that are used to define the invention whereby the metes and bounds of the claimed invention can be ascertained. During patent examination, the pending claims must be given the broadest reasonable interpretation consistent with the specification. MPEP § 2173.05.

A patentee may choose to be his or her own lexicographer and use terms in a manner other than their ordinary meaning, so long as any such specific definition is clearly stated in the patent specification or prosecution history. Mycogen Plant Science v. Monsanto Co. , 243 F.3d 1316, 1327 (Fed. Cir. 2001).

The Applicants respectfully submit the meaning of the term "fractile" is apparent from the specification and drawings at the time the application was filed. Furthermore, the inventors have acted as their own lexicographer in defining the term "fractile" array. The Applicants respectfully direct the Examiner's attention to page 6, lines 7-9 which states that "A fractile array is defined as an array with a fractal boundary contour that tiles the plane without leaving any gaps or without overlapping, wherein the fractile array illustrates improved broadband characteristics." Based on this description, the term "fractile" is a contraction of the words "fractal + tile" forming the word "fractile."

The Applicants also respectfully direct the Examiner's attention to Figures 1A-1C, Figure 12A-12C and 12 where fractile arrays are illustrated. In Figures 1A-1C, an array of antenna elements is shown where the antenna element locations are designated by the numbers 1 and 2. In Figure 12, the antenna element locations, within the array, are shown by the closed circles. Figures 11A-11C illustrate the "tiling" of a plane with unit cells having a Gospher island shape. The fractal boundary contour, in Figures 1A-1C and 12, is illustrated by the outer line which surrounds the array wherein the array consists of the collection of all the antenna elements.

D. Objection to the Specification

As described above for the Objection to the Title, the inventors have acted as their own lexicographer in defining the term "fractile" and that the meaning of the term is readily apparent from the specification and the drawings as filed. The Applicants respectfully request the Examiner's withdraw of the objection to the Specification because the term is not well known in the art.

E. Rejection of claims 1-5 under 35 U.S.C. 112, 2nd paragraph

As described above in section C, the Applicants respectfully submit the meaning of the term "fractile" array is readily apparent from the specification and drawings at the time the application was filed and that that they have acted as their own lexicographer.

1. Rejection of claims 1, 2, 5 and 6

The Examiner states that claims 1, 2, 5 and 6 are indefinite because the meaning for the term "fractile" cannot be determined. As discussed above for the Objection to the Title, the term "fractile is readily apparent from the specification and drawings as filed and that the inventors have acted as their own lexicographer in defining the term "fractile." The Examiner is respectfully directed to page 6, lines 7-9, defining the term "fractile" and Figures 1A-1C, 11A-

11C and 12 where fractile arrays are illustrated. The Applicants respectively request the Examiner's withdrawal of the rejection of claims 1, 2, 5, and 6 under 35 U.S.C. 112, 2nd paragraph.

2. Rejection of claim 2

The Examiner states the recitation, "an array having an irregular boundary contour wherein the irregular boundary contour comprises a plane tiled by a plurality of fractal, said plurality of fractal covers the plane without any gaps or overlaps" is not understood. The Examiner questions what is meant by "irregular boundary contour"?

The Applicants respectfully direct the Examiner's attention to Figures 1A-1C and 11A-11C. As illustrated in Figures 1A-1C, the Applicants have shown stage 1, stage 2 and stage 3 Peano-Gosper fractile arrays. The antenna element locations are shown by the numbers 1 and 2 with the numbers 1 and 2 illustrating the associated current distribution for the antenna. Figures 1A-1C illustrate the boundary of the Peano-Gosper fractile arrays as an irregular contour on a plane. Figures 11A-11C also illustrate the structure of a Peano-Gosper fractile array which has an irregular boundary contour. In these figures, the Examiner's attention is directed to the contour of the line which circumvents the exterior boundary of the array as defining an "irregular boundary contour."

The Applicants respectively request the Examiner's withdrawal of the rejection of claim 2 under 35 U.S.C. 112, 2nd paragraph.

3. Rejection of claim 3

The Examiner states the recitation, "tiling in a plane with a plurality of non-uniform shaped unit cells of an antenna array" is not understood. The Examiner questions what is meant by "tiling a plane with plurality of non-uniform shaped unit cells of an antenna array"?

Figure 12 illustrates an array having a non-uniform shape in which unit cells having a non-uniform shape "tile" a plane to form an antenna array. The non-uniform shaped unit cells are outlined by lines and closed circles in Figure 12 and the antenna array is an arrangement of many antenna elements forming the overall structure of Figure 12. The closed circles indicate where the antenna elements are placed. The antenna array consists of the collection of all antenna elements.

The claim element of "tiling in a plane with a plurality of non-uniform shaped unit cells of an antenna array" is analogous to the work performed by a tile setter. The tile setter may place tiles nonuniform in shape, (i.e., non-uniform shaped unit cells) onto a wall or floor (i.e., plane) to form a mosaic (i.e., array).

4. Rejection of claim 4

Claim 4 depends directly from independent claim 3. Therefore, for the reasons noted above for claim 3, claim 4 is allowable because it depends directly from an allowable base claim.

F. Rejection of claim 5

The Examiner has rejected claim 5 under 35 U.S.C. 102(e) as being anticipated by Werner et al. (US Pub. 2003/0034918). In response to the Examiner's rejection of claim 5 the Applicants respectfully submit that Werner fails to disclose each and every limitation of claim 5. "A claim is anticipated only if each and every element as set forth in the claims is found, either expressly or inherently described, in a single prior art reference." *Verdegaal Bros. v. Union Oil Co. of California,* 814 F.2d 628, 631 (Fed. Cir. 1987).

Claim 5 provides for a method for rapid radiation pattern formation of a fractal array, comprising the steps of: a) employing a pattern multiplication for fractile arrays, comprising: deriving a product formulation for the radiation pattern of a fractile array for a desired stage of

growth; b) recursively applying step (a) to construct higher order fractile arrays; and c) forming an antenna array based on the results of step (b). The Applicants respectfully submit Werner fails to teach the underlined claim elements as set forth above.

The sections cited to in Werner, by the Examiner, refer to the construction of a single fractal antenna not an array of many antenna elements wherein the antenna elements are placed in a manner to form a fractile as defined in the specification.

In particular, the Examiner has cited to Figures 1-47 as disclosing the claim limitation of "employing a pattern multiplication for fractal arrays." The Applicants respectfully submit Figures 1-47 each illustrate a single antenna having the shape of a fractal with varying complexity not an array of many antenna elements.

Regarding the claim element of "deriving a product formulation for the radiation pattern of a fractile array for a desired stage of growth," the Examiner has cited to Figures 1 and 3 and paragraphs [0047]-[0049]. The Applicants respectfully submit that Figures 1 and 2 each illustrate a single antenna having the shape of a fractal with increasing complexity and not an fractile array. Paragraphs [0047]-[0049] describe the construction of a Koch curves, wherein each stage has increasing complexity but the same original pattern. There is no mention in this section of Werner related to deriving a product formulation for a radiation pattern of an array of antenna elements which form the overall shape of a fractal, a fractile array.

Regarding the claim element "recursively applying step (a) to construct higher order fractile arrays," the Examiner has cited to Figures 1 and 2 and paragraph [0049]. As described above, Figures 1 and 2 do not illustrate "fractile arrays." Paragraph [0049], furthermore, describes recursively applying a pattern to produce various stages of a Koch curve not an array of antenna elements which form the overall shape of a fractal, a fractile array.

Lastly, the Examiner has cited to Figures 1 and 2 and paragraph [0050] for disclosing the claim limitation of "forming an antenna array based on the results of step (b)." The Applicants respectfully submit the cited sections refer to the construction of a single antenna by repeatedly applying a pattern not the formation of an fractile array.

Werner, therefore, fails to disclose each and every limitation of claim 5.

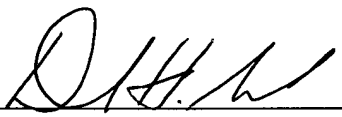
CONCLUSION

The Applicant respectfully requests reconsideration and withdrawal of the rejections under 35 U.S.C. § 112 paragraph 2 and 35 U.S.C. § 102(e) presented in the Office Action mailed December 17, 2004. The Examiner is invited to contact the undersigned at 215-963-5055 to discuss any matter concerning this Application.

The Commissioner is hereby authorized by this paper to charge any fees due in connection with the filing of the response to Deposit Account No. **50-0310**.

Respectfully submitted,

3-15-05
Date

By: 

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